

Appl. No. 09/645,807

Amdt. Dated June 7, 2004

Reply to Office Action of April 7, 2004

REMARKS

Reconsideration of the application is requested.

Claims 1-14, 21, and 22 remain in the application. Claim 1 has been amended.

In "Claim Rejections - 35 USC § 103" item 4 on page 2 of the above identified final Office Action, claims 1-5, 7-9, 12-14, 21, and 22 have been rejected as being obvious over U.S. Patent No. 5,930,639 to *Schuele, et al.* (hereinafter **SCHUELE**) in view of Japanese Patent No. JP-5-315457 to *Watabe* (hereinafter **WATABE**) under 35 U.S.C. § 103(a).

In "Claim Rejections - 35 USC § 103" item 5 on page 4 of the above identified final Office Action, claim 6 has been rejected as being obvious over **SCHUELE** in view of **WATABE** and further in view of U.S. Patent No. 5,976,394 to *Chung* (hereinafter **CHUNG**) under 35 U.S.C. § 103(a).

In "Claim Rejections - 35 USC § 103" item 6 on page 5 of the above identified final Office Action, claim 10-11 have been rejected as being obvious over **SCHUELE** in view of **WATABE** and further in view of U.S. Patent No. 5,436,190 to *Yang, et al.* (hereinafter **YANG**) under 35 U.S.C. § 103(a).

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The rejection has been noted and the claims have been amended in an effort to even more clearly define the invention of the instant application. Support for the changes is found in the on page 18 (see e.g., lines 10-13) of the specification and FIG. 5 and FIG. 6 of the instant application.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful. Claim 1 calls for, *inter alia*, a method of producing an electrode configuration including the following steps.

forming a first conductive layer of the electrode configuration of a material which is **substantially unetchable by chemical dry-etching;**

forming a second conductive layer of the electrode configuration on the first conductive layer from a material which is **etchable by chemical dry-etching;**

structuring the second conductive layer to form a structured second layer;

chemical-physical dry etching the first conductive layer while using the second structured layer as a mask;

applying at least one insulation layer on the electrode configuration, and structuring the insulation layer to form **at least two contact holes with different depths;** and

long overetching the electrode configuration due to the different depths of the contact holes.

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In general, **SCHUELE** teaches a method for precision etching of platinum electrodes, including capacitor electrodes. More specifically, **SCHUELE** indicates that a layer of titanium nitride 44 (the alleged second conductive layer) having a thickness of 100 to 200 angstroms may be formed on a layer of platinum 38 (the alleged first conductive layer 38) having a thickness of 1000 to 3000 angstroms. **SCHUELE** indicates that the titanium nitride layer 44 may be much thinner than the photoresist masks of the prior art due to the high selectivity of the physical ion etching process for the titanium nitride relative to the platinum, which has been found to be approximately 30 to 1 (col. 8, lines 10-38).

In contrast to the claims of the instant application, the **SCHUELE** reference discloses forming only ONE contact opening in the isolation layer. As previously indicated, one of the inventive concepts associated with the invention of the instant application is to produce in one etching step "at least TWO contact holes having different depths" without a breakthrough due to long overetching. **SCHUELE** neither suggests nor contains the relevant teaching that would suggest producing two holes having different depths without a breakthrough due to overetching.

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Clearly, as indicated by the Examiner in the above mentioned in the above identified final Office Action, **SCHUELE** does not show "structuring the insulation layer to form at least two contact holes with different depths" as recited in claim 1 of the instant application. Nor does **SCHUELE** show "long overetching the electrode configuration due to the different depths of the contact holes." as recited in claim 1 of the instant application.

While the **WATABE** reference discloses a method for controlling the etching rate and thereby preventing damage to a plurality of contact holes of different depths, the teaching is limited to the preselection of hole sizes prior to etching. More specifically, **WATABE** discloses controlling a selection ratio of the diameters when forming contact holes through etching. Not forming " a first conductive layer

Clearly, the proposed combination of **SCHUELE** with **WATABE** does not show "long overetching the electrode configuration due to the different depths of the contact holes." as recited in claim 1 of the instant application.

Even assuming, *arguendo*, that the proposed combination would result in "long overetching the electrode configuration due to the different depths of the contact holes" as recited in

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claim 1 of the instant application, there is NO motivation in either **SCHUELE** or **WATABE** to make the proposed combination of **SCHUELE** and **WATABE**. Only "impermissible hindsight" based upon the applicant's disclosure would enable such a combination. As indicated in MPEP 2142:

To reach a proper determination under 35 U.S.C. 103, the examiner must step backward in time and into the shoes worn by the hypothetical "person of ordinary skill in the art" **when the invention was unknown and just before it was made**. In view of all factual information, the examiner must then make a determination whether the claimed invention "as a whole" would have been obvious at that time to that person. Knowledge of applicant's disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the "differences," conduct the search and evaluate the "subject matter as a whole" of the invention. **The tendency to resort to "hindsight" based upon applicant's disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art. (emphasis added).**

Accordingly, the proposed combination must be reached on the basis of the facts gleaned from the prior art, not the applicant's disclosure. Clearly, the proposed combination of **SCHUELE** with **WATABE** does not show the necessary motivation to combine the teaching of using different diameter contact holes for different depths of **WATABE** with the teaching that precision etching may be obtained through the use of multiple layers for an individual contact hole of **SCHUELE**. In fact, **WATABE** teaches against the proposed combination in various ways including the indication that there is an insulation

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layer between the conductive layers and that the variable diameters are necessary to dictate how deep the etching will be. In contrast, the **"long overetching"** of the electrode configuration in the instant application is **"due to the different depths of the contact holes"** as recited in claim 1 of the instant application, NOT the different diameter of the contact hole as recited in **WATABE**.

CHUNG and **YANG** do not compensate for the previously discussed deficiencies. Specifically, **CHUNG** and **YANG** do not teach or suggest **"structuring the insulation layer to form at least two contact holes with different depths"** as recited in claim 1 of the instant application. Nor do the references show **"long overetching the electrode configuration due to the different depths of the contact holes."** as recited in claim 1 of the instant application.

Considering the deficiencies of the proposed combination of **SCHUELE** and **WATABE**, it is believed not to be necessary at this stage to address the secondary references **YANG** and **CHUNG** applied in the rejection of dependent claims 10-11 and 6, respectively, and whether or not there is sufficient suggestion or motivation with a reasonable expectation of success for modifying or combining the references as required by MPEP § 2143.

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It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claim 1.

In view of the foregoing, reconsideration and allowance of claims 1-14, 21, and 22 are solicited.

In the event the Examiner should still find any of the remaining claims to be unpatentable, counsel would appreciate receiving a telephone call so that, if possible, patentable language can be worked out. In the alternative, the entry of the amendment is requested, as it is believed to place the application in better condition for appeal, without requiring extension of the field of search.

If an extension of time is required, petition for extension is herewith made. Any extension fee associated therewith should be charged to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

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Please charge any other fees that might be due with respect
to Sections 1.16 and 1.17 to the Deposit Account of Lerner
and Greenberg, P.A., No. 12-1099.

Respectfully submitted,



For Applicants

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